

Short note

Epidemiological profile and fertility assessment of hydatid cysts surgically removed from patients in Djelfa province, Algeria

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ABSTRACT. A survey on human cystic echinococcosis was carried out in two public health establishments including the state hospital and one private medical clinic in Djelfa province (Algeria) to report the epidemiological profile of surgical cases and to examine the fertility of collected cysts. Total 18 hydatid cysts from 11 patients of different ages living both in rural and urban areas were obtained. Liver localization was noted in 73% of cases compared to lung localization (27%). Microscopic examination showed a fertility rate of 94.45% against 5.55% of sterile cysts.

Keywords: epidemiological profile, fertility, hydatid cysts, humans, Djelfa

Introduction

Hydatidosis or cystic echinococcosis (CE) is important zoonotic disease, both for animal and humans, caused by different species of *Echinococcus granulosus sensu lato* [1]. *Echinococcus granulosus sensu lato* represents a complex species, in which *Echinococcus granulosus sensu stricto* (G1, G2, and G3) is widely distributed and has significant impact on public health worldwide [2]. Cystic echinococcosis is highly endemic in North Africa countries including Algeria, Tunisia, Morocco, Egypt and Libya, both for intermediate and definitive hosts [3]. In Algeria, most of studies were focused essentially on prevalence of livestock hydatidosis and associated risk factors. Molecular data were reported for few studies, which indicated the occurrence of *E. granulosus* s.s. and *E. canadensis* (G6) both in livestock and humans [4,5]. However, little data are available on epidemiology of *Taenia* spp. in definitive host (dogs) as well as on human cystic echinococcosis, especially, because of

absence of exhaustive surveys covering the different provinces of country [6–8]. Citing for example, the prevalence in Algerian population is underestimated and reported rates by the authorities are far from the actual figures. Additionally, compared to data on fertility of hydatid cysts native of ruminants and camels, limited studies were documented regarding testing fertility of hydatid cysts from human cases [9]. Therefore, more thorough surveys are needed to better know its real national prevalence and understand the different factors involved in transmission of human cystic echinococcosis. The present survey reports some data of epidemiological profile and the fertility assessment of hydatid cysts surgically removed from 11 patients in the province of Djelfa (Algeria).

Materials and Methods

A survey on surgical cases previously diagnosed as affected by hydatid cyst was conducted during a period of 11 months in two public health



Figure 1. Hydatid cyst resected from liver

establishments, including the state hospital and one private medical clinic from Djelfa province that is situated in the central part of northern Algeria. Data concerning age, sex and residence location (rural or urban) of operated patients as well as localization and number of resected cysts were collected from divisions of anatomopathology. The fertility of removed hydatid cysts was assessed by microscopic examination for the presence of protoscolex.

Results

A total of 18 hydatid cysts from 11 operated

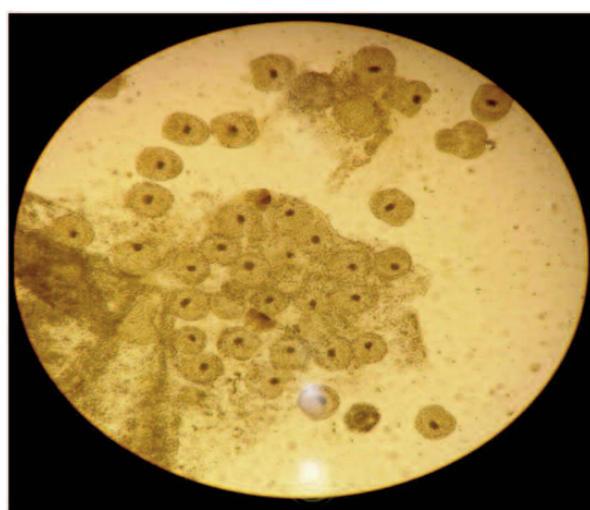


Figure 2. Protoscolex under microscopic examination (objective $\times 10$)

patients were collected at the state hospital and one private medical clinic in Djelfa province (Table 1, Figs 1,2). 55% of hydatidosis cases were young adults (aged of 17 to 33 years) and 45% were adults (aged of 42 to 53 years). Males and females were noted for six and five affected cases, respectively. 36% and 64% of patients were from rural and urban areas, respectively. Liver localization was recorded in 73% of cases, compared to lung localization (27%). Six, three and two patients were found to be infected with one, two and three cysts, respectively. Microscopic examination showed a fertility rate of 94.45%, while, 5.55% of cysts were sterile.

Table 1. Some data concerning epidemiological profile of reported patients with hydatidosis

Patients	Age	Sex	Residence	N° of removed cysts per organ	Cyst localization/fertility
Patient 1	42 years	Female	Urban	1	Liver/sterile
Patient 2	23 years	Male	Rural	3	Liver/fertile
Patient 3	17 years	Male	Rural	2	Liver/fertile
Patient 4	50 years	Female	Urban	1	Liver/fertile
Patient 5	27 years	Male	Urban	3	Liver/fertile
Patient 6	43 years	Male	Rural	1	Lung/fertile
Patient 7	33 years	Male	Rural	2	Lung/fertile
Patient 8	45 years	Female	Urban	1	Lung/fertile
Patient 9	53 years	Female	Urban	2	Liver/fertile
Patient 10	23 years	Female	Urban	1	Liver/fertile
Patient 11	21 years	Male	Urban	1	Liver/fertile

Discussion

Human cystic echinococcosis remains a neglected zoonotic disease in Algeria that has an important impact on public health. In the present report, some data regarding 18 hydatid cysts surgically removed from 11 patients in Djelfa province were collected and their fertility was examined for the presence of protoscolex. Despite the systematic provided data by the national institute of public health (<http://www.insp.dz/>) that records declared cases of human hydatidosis, epidemiological data of Algerian patients suffering cystic echinococcosis (both operated and non-operated patients) remain poorly documented, particularly, for rural community where there is high risk of disease transmission.

In agreement with our collected data, predominantly affected age groups were older children and young adult and slightly more males compared to females [9–11]. Contrary to the present report, most cases were notified to have rural residence [9,12]. Cystic echinococcosis is known to be frequent in rural community, since rural regions bring together intervening actors (dogs and livestock mainly sheep) in development of parasitic cycle. However, in highly endemic regions, it is complex to know the impact of residence location on the frequency of disease given that the contamination of persons may occur in rural environment, while, persons reside in urban area. Additionally, disease transmission in urban areas should not be neglected under certain conditions linked to presence of infected dogs.

The present report as well as other studies recorded the predominance of liver localization of hydatid cysts [12,13]. In contrast, pulmonary localization was mentioned to be most frequent [9,14,15]. Other localization intra and extra abdominal of hydatid cyst have also been indicated [9,14]. Factors leading to a preferential localization of hydatid cysts seem to be unclear. Some investigations have indicated the implication of the infecting strain and organ-related clinical manifestation allowing an early diagnosis [14,15]. Our results regarding the number of removed cysts per organ corroborate the findings of previous studies where most of patients had single cyst [9,12]. Fertility rate of examined cysts was high in the present report as well as in previous studies [9,12,14,15]. High fertility of cysts in humans will obviously not serve in the maintenance of parasitic

cycle, but increase risk occurrence of secondary or peritoneal hydatidosis [9,14].

In conclusion, cystic echinococcosis endangers seriously the health of Algerian population and findings of the present report instantiate the situation. Therefore, an advanced information system should be developed in order to record epidemiological data of all surgically cases of hydatidosis from all state and private hospital institutions. Such information system associated with exhaustive epidemiological and molecular surveys, will lead to knowledge of the real prevalence and incidence of this disease and a rational analysis of transmission mechanisms and various risk factors. Additionally, a better understanding of epidemiology of infection in animals, particularly in definitive hosts, will help in the implementation of effective preventive measures.

Acknowledgements

The authors thank strongly all the heads of department from hospital of Djelfa and surgeons from Mourouj private medical clinic for their kind collaboration.

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Received 20 January 2021

Accepted 05 March 2021